

**In the Claims**

1 1. (Currently Amended) A method of cooling a low Z target material of a neutron source  
assembly, comprising ~~the step of~~:

2 providing, through by using a nozzle, a concentrated flow of circulating liquid gallium  
3 past in a direction normal to a non-bombarded surface of the low Z target material to cool the  
4 low Z target material.

5 2. (Currently Amended) The method of claim 1, wherein said step of circulating  
6 ~~comprises the steps of~~:

1 providing a reservoir of liquid gallium; and  
2 pumping the liquid gallium from the reservoir, through the nozzle, to the low Z target  
3 material to cool the target material and through a heat exchanger to remove heat from the liquid  
4 gallium.

5 **Claim 3 (Cancelled)**

6 4. (Original) The method of claim 2, wherein the target material comprises beryllium.

7 5. (Currently Amended) A neutron source assembly having a liquid cooled target,  
8 comprising:

1 an accelerator based neutron source including modulator/reflector assembly that includes  
2 a low Z target material that is bombarded by accelerated particles to produce a neutron flux; and  
3 a cooling system that to circulates liquid gallium through said modulator/reflector  
4 accelerator based neutron source to cool the low Z target material;  
5 said cooling system including a nozzle to provide a concentrated flow of liquid gallium in  
6 a direction normal to a non-bombarded surface of the target material.

1           6. (Currently Amended) The neutron source assembly of claim 5, wherein said cooling  
2 system comprises:

3           a reservoir of liquid gallium;

4           a heat exchanger in fluid connection with said reservoir of liquid gallium; and

5           means for circulating said liquid gallium between said reservoir of liquid gallium, said  
6 heat exchanger and said ~~modulator/reflector assembly~~ accelerator based neutron source.

1           7. (Original) The neutron source assembly of claim 6, wherein said means for circulating  
2 comprises a pump.

1           8. (Currently Amended) A liquid cooling system for a neutron source assembly, said  
2 cooling system comprising:

3           a reservoir of liquid gallium;

4           a heat exchanger in fluid connection with said reservoir of liquid gallium;

5           a nozzle to provide a concentrated flow of liquid gallium in a direction normal to a non-  
6 bombarded surface of a low Z target material within the neutron source assembly; and

7           means for circulating said liquid gallium between said reservoir of liquid gallium, said  
8 heat exchanger and the neutron source assembly to remove heat from a neutron generating low Z  
9 target ~~low Z~~ material within the neutron source assembly.